



Oroville Facilities Relicensing Operations Modeling Workshop #3

October 20, 2003





Workshop Agenda

- Welcome and Introduction
- Overview of Modeling Workshop
- Benchmark Study Results (Existing Conditions)
- Lunch
- Sensitivity Analyses
 - Scenario: Eliminate Pump-Back Operations
 - Scenario: Level of SWP Demand
 - Scenario: Downstream Extent of Temperature Control
- Discussion
- Next Steps
- Adjourn



Break



Break



Workshop Purpose and Objectives

- Review Purposes and Protocols for Operations Modeling
- Understanding of Benchmark Study as the Basis for Comparative Analysis
- Understanding the Purpose of Sensitivity Analyses



Participation Principles

- **Participate** – Attend the Workshop
- **Learn** – Learn about resources, people, roles, and process
- **Represent** – Bring issues and interests forward from others whose interests you share
- **Cooperate** – Work with others in the Workshop to share information and consider options
- **Educate** – Report back to others who share your interests



Workshop Ground Rules

- **Commit to Being Fully Present**
 - No cell phones, pagers, voicemail, etc.
 - Ask for what you need from the seminar and participants
- **Honor Our Time Limits**
 - Keep comments and discussion concise
 - Stay focused on the topic – Use the parking lot for other issues
- **Respect Each Other**
 - Listen carefully to other participants
 - Respond to ideas and issues, not individuals
- **Support Constructive Discussion**
 - Suggest improvements and solutions
 - Build on others' ideas – Use "and" instead of "but"



Workshop Agenda

- Welcome and Introduction
- Overview of Modeling Workshop
 - Topics Covered in Previous Workshops
 - About this Workshop
 - Outlook for Future Workshops
- Benchmark Study Results (Existing Conditions)
- Lunch
- Sensitivity Analyses
- Discussion
- Next Steps
- Adjourn



Topics Covered in Previous Workshops

- Workshop (Seminar) #1 – June 24, 2003
- Workshop #2 – August 12, 2003
- A learning experience and living process for sharing information and communicating ideas



Topics Covered in Previous Workshops

- Workshop #1 (Seminar) – June 24, 2003
 - Model Basics to Philosophy
 - Operations Model Suite
 - Modeling Request Protocol



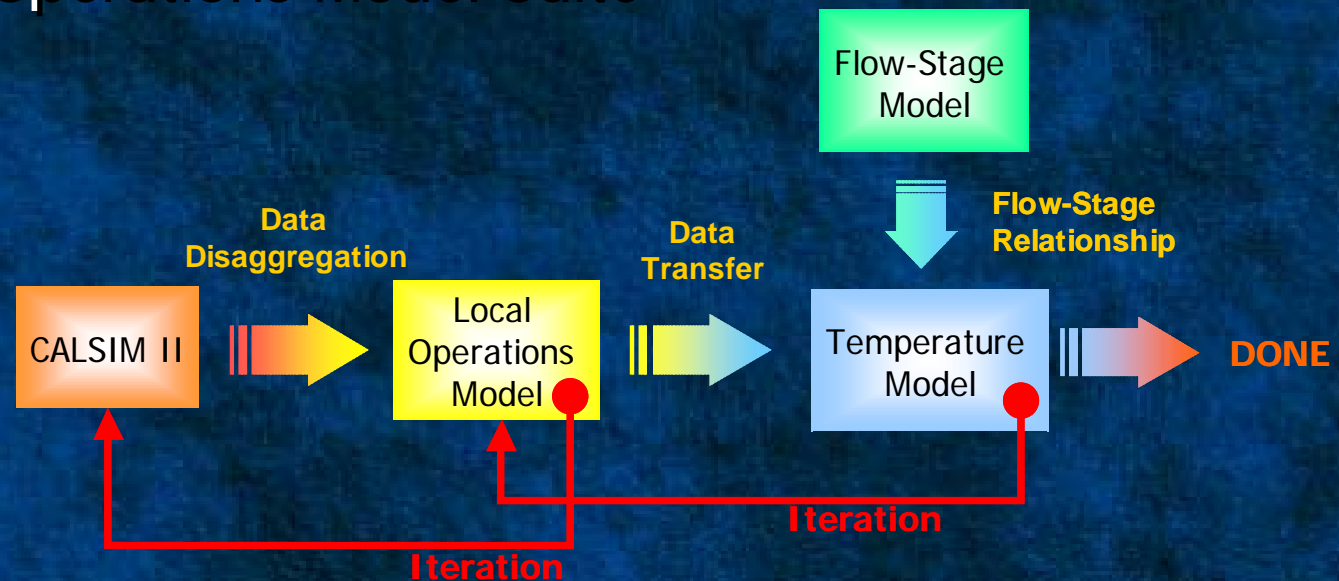
Topics Covered in Previous Workshops

- Workshop #1 (Seminar) – June 24, 2003
 - Model Basics to Philosophy
 - Operations modeling **supports** Work Groups in planning activities for the Relicensing program
 - Three keys to success
 - Matching the modeling purposes
 - Getting the right information
 - Managing the modeling effort
 - Operations Model Suite
 - Modeling Request Protocol



Topics Covered in Previous Workshops

- Workshop #1 (Seminar) – June 24, 2003
 - Model Basics to Philosophy
 - Operations Model Suite



- Modeling Request Protocol



Topics Covered in Previous Workshops

- Workshop #1 (Seminar) – June 24, 2003
 - Model Basics to Philosophy
 - Operations Model Suite
 - Modeling Request Protocol
 - Collaboration among requestor(s), modeling coordinator (Curtis Creel), and modeling team members
 - Objectives for managing modeling efforts
 - Address more requests
 - Support relicensing program more effectively
 - Provide quicker turnaround time



Topics Covered in Previous Workshops

- Workshop #2 – August 12, 2003
 - Model Basics to Philosophy
 - Benchmark Study
 - Definition
 - Review of Benchmark Study (CALSIM II Portion)
 - Simulation for Historical Operation
 - Review from an Operator's viewpoint
 - Partial Results for Existing Conditions (CALSIM II Portion)
 - Matching Results with Interest Groups' Needs



Topics Covered in Previous Workshops

- **Workshop #2 – August 12, 2003**
 - Use of posters to capture topics covered in previous Workshops
 - Operations Model Suite
 - Modeling Request Protocol
 - Review of Benchmark Study: CALSIM II Simulation of Historical Operation (1975 – 1998), focusing on SWP operation
 - Panel of modeling specialists at computer workstations to answer stakeholders' questions



About this Workshop

- Workshop #3 – October 20, 2003
 - More on Benchmark Study
 - Development of Benchmark Study
 - Benchmark Study Results (Existing Conditions)
 - Sensitivity Analysis
 - Purpose and Development
 - Eliminate Pump-Back Operations
 - Level of SWP Demand
 - Downstream Extent of Temperature Control by Oroville Facilities



About this Workshop

- Workshop #3 – October 20, 2003
 - More Posters
 - 🎃 Modeling Basics to Philosophy
 - Modeling Request Protocol
 - Operations Model Suite
 - 🎃 Data Disaggregation
 - 🎃 Temperature Control Actions
 - CALSIM II Simulation of Historical Operation (1975 – 1998), focusing on SWP operations
 - ~~CALSIM II Review by Operators~~
 - ~~Benchmark Study (Existing Conditions)~~
 - 🎃 2 Sensitivity Analyses
 - 🎃 Modeling Output Procedure
 - 🎃 Other Related Models



About this Workshop

- Workshop #3 – October 20, 2003
 - Discussion Format
 - No Break-out Sessions
Break-out sessions are planned for future workshops
 - Panel Discussion
Timely discussion after each scenario is presented
 - Longer Breaks
Allowing discussion and review of posters
 - Poster Handouts
References for the future



About this Workshop

- Workshop #3 – October 20, 2003
 - Modeling Result Format
 - **Presentation:** Summary Results
 - **Poster:** Summary Results with a Brief Introduction and Summary of Findings
 - **Report:** Detailed Discussion on Modeling Approach, and Findings
 - **Database:** Complete Results and Summary Tables and Plots;
 - Requests through E&O Workgroup
 - Contact: Lori Brown

Preliminary Results, Subject to Revisions – for Collaborative Process Only



About this Workshop

- **Workshop #3 – October 20, 2003**
 - Summary Results for Presentation
 - Something for Each Interest/Workgroup
 - Template for Result Summary
 - Water supply **CALSIM II** **Water Supply**
 - SWP allocation
 - Power generation **HYDROPS** **Power Generation**
 - Annual power generation with Pump-Back percentage
 - On/off peak comparison
 - Monthly pattern with Pump-Back percentage



About this Workshop

- Workshop #3 – October 20, 2003
 - Template for Summary Results (cont'd)
 - Temperature **WQRRS**
 - Agricultural diversions in Afterbay **Agricultural**
 - River temperature at Robinson's Riffle **Environmental**
 - Reservoir Levels **CALSIM II** **Recreation**
 - Memorial day
 - Independence Day
 - Labor Day
 - River flows **CALSIM II** **All**
 - Reasons for Releasing from Oroville Reservoir



About this Workshop

- Workshop #3 – October 20, 2003
 - Customization of Summary Results for special topic or interest
 - Contents vary by topic/interest
 - Example: Downstream Extent of Temperature Control



Outlook for Future Workshops

- Topics in Future Workshops (unscheduled)
 - Benchmark Study (Future Conditions)
 - Additional Analyses
- Potential Break-out Sessions by Resource, Topic, or Workgroup



Now, Let's Take a Break





Workshop Agenda

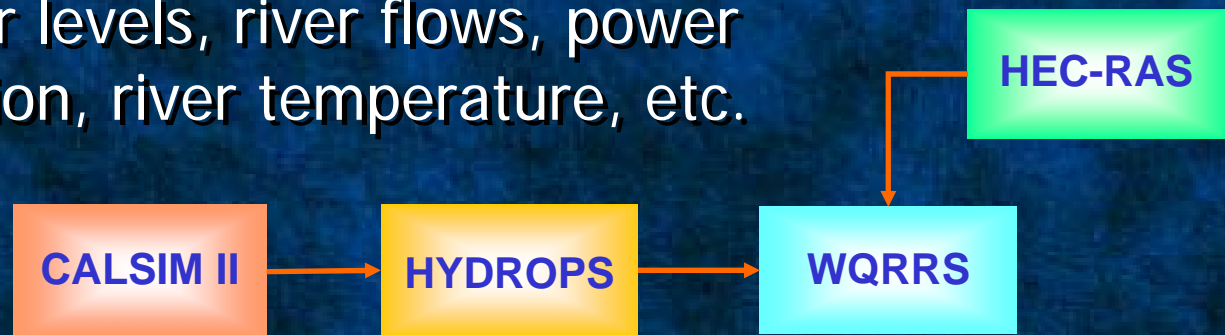
- Welcome and Introduction
- Overview of Modeling Workshop
- **Benchmark Study**
 - Definition
 - Establishing Details
 - Summary Results (Existing Conditions)
- Lunch
- Sensitivity Analyses
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Benchmark Study

– Definition

- Purpose – Basis of comparison for evaluating resource action proposals
- Representation – Conditions described by the entire operations model suite
 - Water supply, reservoir storage, reservoir levels, river flows, power generation, river temperature, etc.





Benchmark Study

– Variation and Perspective

- Variations

Workshop Focus

- Existing Conditions – 2001 Level of Demand
- Future Conditions – 2030 Level of Demand

- Perspective of future changes

- Future Conditions version of CALSIM II may not be compatible with Existing Conditions version
- Revision of Benchmark Study could result in schedule delays for Relicensing process
- **IMPORTANT** to balance modeling updates with FERC application schedule



Benchmark Study

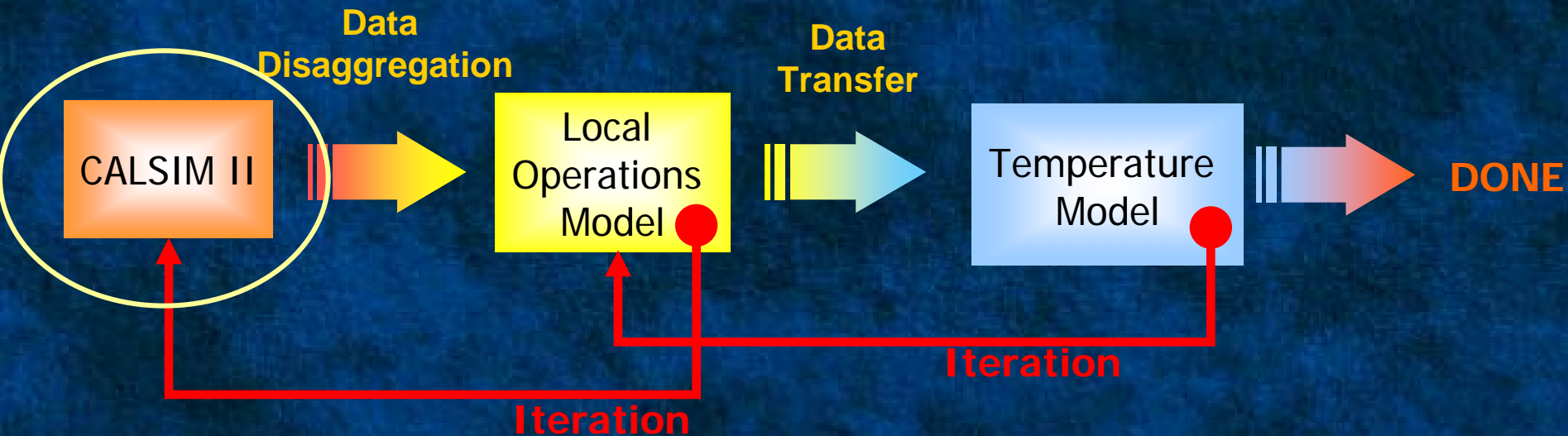
– Establishing Details

- Reviewing results from every step for reasonableness of simulated operations
 - CALSIM II
 - Data disaggregation (monthly to weekly)
 - HYDROPS
 - WQRRS
- Recognizing CALSIM II's prominent role in establishing operational baseline



Benchmark Study

– Establishing Details



- Water supply conditions
- Monthly operations and water budget

- Power generation
- Hourly operations

- Reservoir temperature
- River temperature
- Ag diversion temperature



Benchmark Study

– Establishing Details, CALSIM II

- Important CALSIM II assumptions
 - Observe existing laws, regulations, agreements, water rights, and Table A Amounts including
 - COA, D-1485, D-1641, FRSA entitlements, instream flow requirements, BOs, etc.
 - SWP Demand
 - Existing Conditions: Variable demands in relation to hydrological conditions
 - Future Conditions: "TABLE A" Amounts
 - Provide a minimum SWP allocation of 5%



Benchmark Study

– Establishing Details, CALSIM II

- Review of CALSIM II

- Ongoing CALSIM II peer review process

Supported by Relicensing Program

- Simulation of historical operations (1975 to 1998)

Performed outside of Relicensing Program

- Special application outside of the normal use of CALSIM II
 - Favorable comparison

- Qualitative assessment on simulated SWP operation

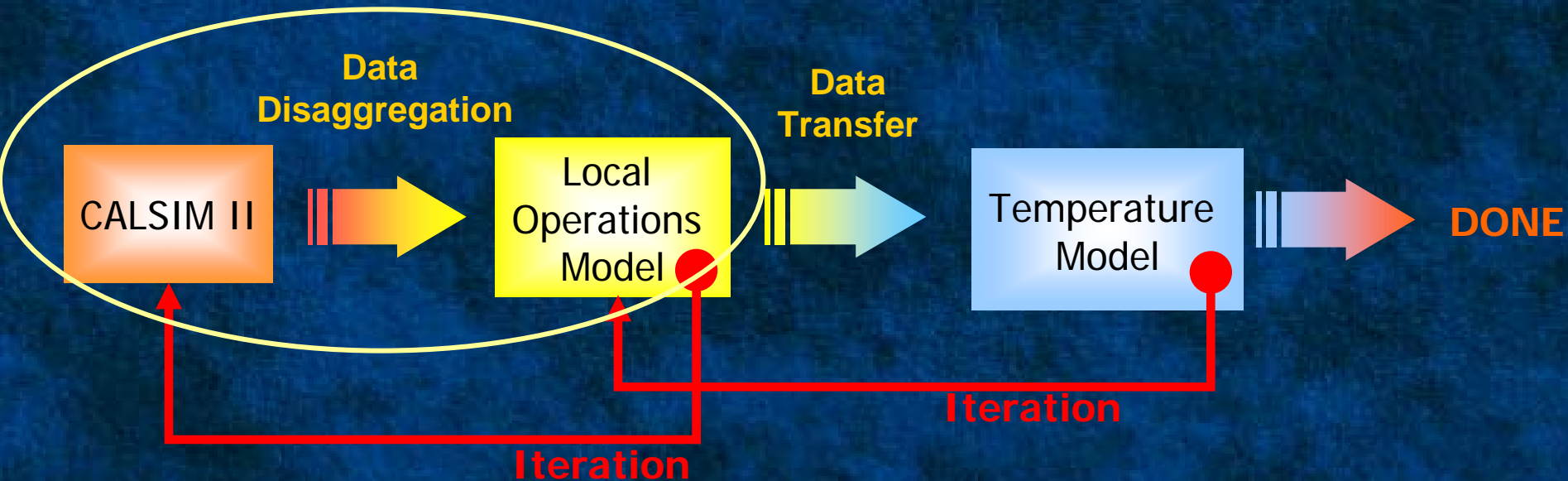
Performed for Relicensing Program

- Simulated allocations match operators' assessment in 68 percent of the years
 - No obvious biases were identified



Benchmark Study

– Establishing Details, Data Disaggregation



- Water supply conditions
- Monthly operations and water budget

- Power generation
- Hourly operations

- Reservoir temperature
- River temperature
- Ag diversion temperature